

Amendments to The Claims

1. (currently amended) A method comprising:

using an intermediary node on a network to forward messages on behalf of a plurality of other nodes on the network;

determining, in the intermediary node, that a first message received by the intermediary node from a first downstream node and destined for an upstream node should not be forwarded, based on congestion detected on the network;

using a flow control algorithm in the intermediary node to compute a back-off time period, wherein the back-off time period is a minimum amount of time for the first downstream node to wait before resending the message destined for the upstream node ~~and the flow control algorithm is a function of at least one of: a received back-off message received from the upstream node or failure of the upstream node to respond to another message previously forwarded by the intermediary node to the upstream node; and;~~

sending ~~an a~~ first outgoing back-off message including the back-off time period from the intermediary node to the first downstream node in response to the first message and said determining that the first message should not be forwarded, ~~wherein the computed back-off time period is included in a header of the outgoing back-off message and wherein the header is a hypertext transport protocol (HTTP) header;~~

receiving, in the intermediary node, a second message destined for the upstream node, the second message from a second downstream node;

in response to receiving the second message, determining in the intermediary node whether the back-off time period in said first outgoing back-off message sent to the first downstream node has expired; and

if the back-off time period sent to the first downstream node has not expired, sending a second outgoing back-off message from the intermediary node to the second downstream node.

2. (canceled)

3. (previously presented) A method as recited in claim 1, further comprising using the intermediary node to detect the congestion on the network.

4. (currently amended) A method as recited in claim 3, wherein using the intermediary node to detect the congestion on the network comprises detecting congestion on the network based on ~~the~~ an incoming back-off message received by the intermediary node from the upstream node on the network.

5. (previously presented) A method as recited in claim 4, wherein the back-off message received by the intermediary node specifies one or more back-off criteria.

6. (previously presented) A method as recited in claim 5, wherein the back-off criteria comprise metadata indicating applicability of the back-off message received by the intermediary node.

7. (previously presented) A method as recited in claim 3, wherein using the intermediary node to detect the congestion on the network comprises detecting congestion on the network based on a failure by the upstream node on the network to respond to a request forwarded by the intermediary node.

8. (canceled)

9. (canceled)

10. (canceled)

11. (canceled)

12. (canceled)

13. (original) A method as recited in claim 1, wherein said determining comprises using a back-off strategy to determine when a request received by the intermediary node should not be forwarded, and wherein the method further comprises adapting the back-off strategy dynamically based on operation of the network.

14. (currently amended) A method of operating an intermediary network node, the method comprising:

using the intermediary network node to proxy requests and responses to requests between a plurality of clients and a plurality of servers, wherein at least one of the clients is a mobile client operating on a wireless network and at least one of the servers operates on a landline network, the intermediary network node coupled between the wireless network and the landline network;

using the intermediary network node to convert requests between a wireless protocol used by the wireless network and a second protocol used by the landline network;

using the intermediary network node to detect network congestion on at least the landline network;

determining, in the intermediary network node, that a first request received by the intermediary network node from one of the clients destined for one of the servers should not be forwarded by the intermediary network node, based on network congestion on the landline network detected by the intermediary network node;

using a flow control algorithm in the intermediary node to compute a back-off time period, wherein the back-off time period is a minimum amount of time for one of the clients to wait before resending the request destined for one of the servers ~~and the flow control algorithm is a function of at least one of: a received back-off message received from the upstream node or failure of the upstream node to respond to a message previously forwarded by the intermediary node to the upstream node; and;~~

sending ~~an a~~ first outgoing back-off message including the back-off time period from the intermediary node to a first client in the plurality of clients in response to the first request and said determining that the first request should not be forwarded, ~~wherein the computed back-off time period is included in a header of the outgoing back-off message and wherein the header is a hypertext transport protocol (HTTP) header;~~

receiving, in the intermediary node, a second request destined for said one of the servers, the second request from the mobile client;

in response to receiving the second request, determining in the intermediary node whether the back-off time period in said first outgoing back-off message sent to the first client has expired; and

if the back-off time period sent to the first client has not expired, sending a second outgoing back-off message from the intermediary node to the mobile client.

15. (original) A method as recited in claim 14, wherein the landline network is the Internet.

16. (canceled)

17. (currently amended) A method as recited in claim 14, wherein said using the intermediary network node to detect the congestion on the network comprises receiving ~~the~~ an incoming back-off message from an upstream node on the network.

18. (previously presented) A method as recited in claim 14, wherein said using the intermediary network node to detect the congestion on the network comprises detecting a failure by one of the servers to respond to a request forwarded by the intermediary network node.

19. (canceled)

20. (canceled)

21. (canceled)

22. (canceled)

23. (original) A method as recited in claim 14, wherein said determining comprises using a back-off strategy to determine when a request received by the intermediary network node should

not be forwarded, and wherein the method further comprises adapting the back-off strategy dynamically based on operation of the network.

24. (currently amended) A processing system for use as an intermediary node on a network, the processing system comprising:

means for forwarding messages on behalf of a plurality of other nodes on the network;

means for receiving from a first downstream node on the network a first message destined for an upstream node on the network;

means for detecting congestion on the network;

means for determining that the first message should not be forwarded, based on congestion on the network;

means for using a flow control algorithm in the intermediary node to compute a back-off time period, wherein the back-off time period is a minimum amount of time for the downstream node to wait before resending the message destined for the upstream node ~~and the flow control algorithm is a function of at least one of: a received back-off message received from the upstream node or failure of the upstream node to respond to another message previously forwarded by the intermediary node to the upstream node; and;~~

means for sending ~~an~~ a first outgoing back-off message including the back-off time period from the intermediary node to the first downstream node in response to the first message and said determining that the first message should not be forwarded, ~~wherein the computed back-off time period is included in a header of the outgoing back-off message and wherein the header is a hypertext transport protocol (HTTP) header.;~~

means for receiving, in the intermediary node, a second message destined for the upstream node, the second message from a second downstream node;

means for determining in the intermediary node, in response to receiving the second message, whether the back-off time period in said first outgoing back-off message sent to the first downstream node has expired; and

means for sending, if the back-off time period sent to the first downstream node has not expired, a second outgoing back-off message from the intermediary node to the second downstream node.

25. (currently amended) A machine-readable program storage medium storing computer program code, the code for execution in an intermediary node on a network to cause the intermediary node to perform a process comprising:

communicating messages between a plurality of clients on the network and a plurality of servers on the network;

receiving from a client on the network a request destined for a server on the network;

detecting congestion on the network, and

determining that the request received by the intermediary node from a first client on the network destined for a server on the network should not be forwarded by the intermediary node, based on congestion of the network;

using a flow control algorithm in the intermediary node to compute a back-off time period, wherein the back-off time period is a minimum amount of time the first client to wait before resending the request destined for the server ~~and the flow control algorithm is a function of at least one of: a received back-off message received from the upstream node or failure of the upstream node to respond to a message previously forwarded by the intermediary node to the upstream node; and;~~

sending ~~an a~~ first outgoing back-off message including the back-off time period from the intermediary node to the first client in response to the request and said determining that the request should not be forwarded, ~~wherein the computed back-off time period is included in a header of the outgoing back-off message and wherein the header is a hypertext transport protocol (HTTP) header;~~

receiving, in the intermediary node, a second request destined for the server, the second request from a second client;

in response to receiving the second request, determining in the intermediary node whether the back-off time period in said first outgoing back-off message sent to the first client has expired; and

if the back-off time period sent to the first client has not expired, sending a second outgoing back-off message from the intermediary node to the second client.

26. (currently amended) A processing system for use as an intermediary node on a network, the processing system comprising:

a processor;

a data communication device coupled to the processor to communicate data between the processing system and a plurality of other nodes on the network; and

a storage facility coupled to the processor and storing instructions, for execution by the processor, which configure the processing system to execute a process to proxy requests and responses on behalf of the plurality of other nodes on the network, the process including:

forwarding requests from a plurality of clients on the network to a plurality of servers on the network;

forwarding responses received from the servers to the clients;

using the intermediary node to detect congestion on the network;

determining, in the intermediary node, when a first request received by the intermediary node from a first client on the network destined for a server on the network should not be forwarded by the intermediary node, based on congestion of the network;

using a flow control algorithm in the intermediary node to compute a back-off time period, wherein the back-off time period is a minimum amount of time for the client to wait before resending the request destined for the server ~~and the flow control algorithm is a function of at least one of: a received back-off message received from the upstream node or failure of the upstream node to respond to a message previously forwarded by the intermediary node to the upstream node; and;~~

sending ~~an a~~ first outgoing back-off message including the back-off time period from the intermediary node to the first client in response to the first request and said determining that the first request should not be forwarded, ~~wherein the computed back-off time period is included in a header of the outgoing back-off message and wherein the header is a hypertext transport protocol (HTTP) header.;~~

receiving, in the intermediary node, a second request destined for the server, the second request from a second client;

in response to receiving the second request, determining in the intermediary node whether the back-off time period in said first outgoing back-off message sent to the first client has expired; and

if the back-off time period sent to the first client has not expired, sending a second outgoing back-off message from the intermediary node to the second client.

27. (canceled)

28. (currently amended) A processing system as recited in claim 26, wherein using the intermediary node to detect the congestion on the network comprises detecting congestion on the network based on ~~the~~ an incoming back-off message received by the intermediary node from ~~the~~ an upstream node on the network.

29. (previously presented) A processing system as recited in claim 28, wherein the back-off message received by the intermediary node specifies one or more back-off criteria.

30. (previously presented) A processing system as recited in claim 29, wherein the back-off criteria comprise metadata indicating applicability of the back-off message received by the intermediary node.

31. (currently amended) A processing system as recited in claim 26, wherein using the intermediary node to detect the congestion on the network comprises detecting congestion on the network based on a failure by ~~the~~ an upstream node on the network to respond to a request forwarded by the intermediary node.

32. (canceled)

33. (canceled)

34. (previously presented) The method of claim 1, wherein the intermediary node comprises a telephony switch.

35. (new) The method of claim 1, wherein the flow control algorithm is a function of at least one of: an incoming back-off message received from the upstream node or failure of the upstream node to respond to another message previously forwarded by the intermediary node to the upstream node.

36. (new) The method of claim 1, wherein the back-off time period is included in a header of the outgoing back-off message.

37. (new) The method of claim 36, wherein the header is a hypertext transport protocol (HTTP) header.

38. (new) The method of claim 1, further comprising configuring the intermediary node to convert messages between a wireless access protocol (WAP) used on a wireless network and hypertext transport protocol (HTTP) used on a landline network, perform content caching and act as a firewall.

39. (new) The method of claim 1, wherein traffic between at least one of the downstream nodes and the intermediary node is on a wireless network, the congestion detected is on a landline network, and sending at least one of the outgoing back-off messages reduces traffic in the wireless network.